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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

IWASHKO, LEV

ART UNIT	PAPER NUMBER
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2186

DATE MAILED: 03/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/816,268

Applicant(s)

KHAN ET AL.

Examiner

Lev I. Iwashko

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-8 and 20-22 is/are allowed.
- 6) ☒ Claim(s) 1,2 and 9-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following are quotations of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 9 and 19 are rejected under U.S.C. 102(b) as being anticipated by Blumenau et al. (US Patent 6,421,711 B1).

Claim 1. A method, comprising:

- retrieving a set of virtual addresses used by an agent; (*Column 2, lines 48-50 – State the following: “The storage controller is programmed to provide a plurality of virtual ports”*)
- assigning said virtual addresses to a first set of physical addresses; (*Abstract, lines 7-15 – State the following: “The virtual ports appear to the hosts as physical ports in the data network. For example, in a Fiber-Channel network, the virtual ports have World Wide Names (WWNs) and are assigned temporary addresses (S_Ds), and the virtual switch provides a name server identifying the WWNs and S_IDs of the virtual ports. For convenient partitioning of storage among host processors, one or more virtual ports are assigned to each host, and a set of storage volumes are made accessible from each virtual port”*)
- generating a first assignment cost value for said assignment; (*Column 10, lines 39-51 – State the following: “Although the WWNs of the source and destination ports could be used in each request to uniquely identify the source and destination ports, each WWN contains so many bits that an undue amount of transmission bandwidth and data processing capability would be expended if the source and destination*

WWNs were used in each request. Therefore, it is desirable to assign a temporary identifier to each port in the data network in such a fashion that the identifier is unique to the configuration of the network at any given time, but not necessarily unique to each port for all time. Therefore, such a temporary identifier can have fewer bits than a WWN yet uniquely identify a source or desired destination of a request transmitted through the network”)

- *and reassigning said virtual addresses to a second set of physical addresses using said first assignment cost value. (Column 10, lines 61-67 and Column 11, lines 1-2 – State the following: “The use of temporary rather than permanent identifiers for source and destination addresses in the network introduces the problem of assigning and reassigning the temporary identifiers when the configuration of the network is defined and changed. For example, when a private loop is changed into a public loop by connecting a port of a switch to the loop, temporary addresses must be assigned to other ports of the switch and to the ports of devices that become connected to those other ports”)*

Claim 2. The method of claim 1, wherein said first and second sets of physical addresses correspond to a plurality of memory types. (Column 6, lines 1-4 and Column 7, lines 1-9 – State the following, which shows how there are many different memory types: With reference to FIG. 1 of the drawings, there is shown a cached storage subsystem 20 connected via a data network 21 to a plurality of hosts 22, 23, 24, 25. The cached storage subsystem 20 includes storage volumes 26 and a storage controller 27 for controlling access of the hosts to the storage volumes. The storage volumes are logical units of storage distributed over one more storage devices 28, 29, 30, and 31. The storage devices are magnetic disk drives, optical disk drives, tape drives, solid-state memory devices, or other storage devices capable of providing nonvolatile data storage. Presently

the preferred storage devices are magnetic disk drives each having a storage capacity of at least 46 gigabytes")

Claim 9. The method of claim 1, wherein said reassigning comprises moving data objects for said agent from said first set of physical addresses to said second set of physical addresses. *(Column 10, lines 61-67 and Column 11, lines 1-2 – State the following: “The use of temporary rather than permanent identifiers for source and destination addresses in the network introduces the problem of assigning and reassigning the temporary identifiers when the configuration of the network is defined and changed. For example, when a private loop is changed into a public loop by connecting a port of a switch to the loop, temporary addresses must be assigned to other ports of the switch and to the ports of devices that become connected to those other ports”)*

Claim 19. An article comprising:

- a storage medium; *(Figure 4, Component 77 – Shows a storage medium)*
- said storage medium including stored instructions that, *(Column 23, lines 4-5 – Declare instructions)*
- when executed by a processor, are operable to retrieve a set of virtual addresses used by an agent, assign said virtual addresses to a first set of physical addresses, generate a first assignment cost value for said assignment, and reassign said virtual addresses to a second set of physical addresses using said first assignment cost value. *(Column 2, lines 48-50 – State the following: “The storage controller is programmed to provide a plurality of virtual ports”. Abstract, lines 7-15 – State the following: “The virtual ports appear to the hosts as physical ports in the data network. For example, in a Fiber-Channel network, the virtual ports have World Wide Names (WWNs) and are assigned temporary addresses (S_Ds), and the virtual switch provides a name server identifying the WWNs and S_IDs of the virtual ports.*

For convenient partitioning of storage among host processors, one or more virtual ports are assigned to each host, and a set of storage volumes are made accessible from each virtual port". Column 10, lines 39-51 – State the following: "Although the WWNs of the source and destination ports could be used in each request to uniquely identify the source and destination ports, each WWN contains so many bits that an undue amount of transmission bandwidth and data processing capability would be expended if the source and destination WWNs were used in each request. Therefore, it is desirable to assign a temporary identifier to each port in the data network in such a fashion that the identifier is unique to the configuration of the network at any given time, but not necessarily unique to each port for all time. Therefore, such a temporary identifier can have fewer bits than a WWN yet uniquely identify a source or desired destination of a request transmitted through the network". Column 10, lines 61-67 and Column 11, lines 1-2 – State the following: "The use of temporary rather than permanent identifiers for source and destination addresses in the network introduces the problem of assigning and reassigning the temporary identifiers when the configuration of the network is defined and changed. For example, when a private loop is changed into a public loop by connecting a port of a switch to the loop, temporary addresses must be assigned to other ports of the switch and to the ports of devices that become connected to those other ports")

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 10 is rejected under 35 U.S.C.103(a) as being unpatentable over Blumenau et al. further in view of Ozcelik et al. (US Patent 5,928,321).

Blumenau teaches the portion of Claim 10 as follows:

Claim 10. An apparatus, comprising:

- a memory assignment module to couple to said task manager, said memory assignment module to assign said virtual addresses to a first set of physical addresses for a plurality of memory devices; (*Abstract, lines 7-15 – State the following: “The virtual ports appear to the hosts as physical ports in the data network. For example, in a Fiber-Channel network, the virtual ports have World Wide Names (WWNs) and are assigned temporary addresses (S_Ds), and the virtual switch provides a name server identifying the WWNs and S_IDs of the virtual ports. For convenient partitioning of storage among host processors, one or more virtual ports are assigned to each host, and a set of storage volumes are made accessible from each virtual port”*)
- and a memory bandwidth module to couple to said memory assignment module, said memory bandwidth manager module to generate an assignment cost value for said assignment, and reassign said virtual addresses to a second set of physical addresses to lower said assignment cost value. (*Column 10, lines 39-51 – State the following: “Although the WWNs of the source and destination ports could be used in each request to uniquely identify the source and destination ports, each WWN contains so many bits that an undue amount of transmission bandwidth and data processing capability would be expended if the source and destination WWNs were used in each request. Therefore, it is desirable to assign a temporary identifier to each port in the data network in such a fashion that the identifier is unique to the configuration of the network at any given time, but not necessarily unique to each port for all time. Therefore, such a temporary identifier can have fewer bits than a WWN yet uniquely identify a source or desired destination of a request transmitted through the network”. Column 10, lines 61-67 and Column 11, lines 1-2 – State the following: “The use of temporary rather than permanent identifiers for source and destination addresses in the network introduces the problem of assigning and reassigning the temporary identifiers when the configuration of the network is defined and changed. For example, when a private loop is changed into a public loop by connecting a port of a switch to the loop, temporary*

addresses must be assigned to other ports of the switch and to the ports of devices that become connected to those other ports")

Blumenau's invention differs from the claimed invention in that there is no specific reference to a task manager.

Blumenau fails to teach the portion of Claim 10, which states "a task management module to retrieve a set of virtual addresses used by an agent". However, Ozcelik's invention discloses the following: "Ultimately, the highest priority set bit is found, and the task manager responds to this bit by identifying the virtual instruction memory address of the first instruction of the associated task handler. This virtual address is stored in a temporary register. Next in step 172, the task manager executes a CALL instruction, causing execution to sequence to the stack and swap manager PUSH routine 120. As discussed in detail below, the stack and swap manager uses the virtual instruction memory address stored in the temporary register to commence execution of the desired task handler. After step 172, the task manager returns to step 168 to search for another set task flag" (Column 10, lines 3-14). It would have been obvious to one of ordinary skill in the art, having the teachings of the "Virtual Ports for Data Transferring of a Data Storage System" of Blumenau and Ozcelik's "Task and Stack Manager for Digital Video Decoding" before him at the time the invention was made, to combine the inventions so that a task manager could be coupled to the memory assignment module so that the system would run more efficiently and with less errors.

5. Claim 11 is rejected under 35 U.S.C.103(a) as being unpatentable over Blumenau et al., as applied to Claim 10 above, further in view of Ozcelik et al. (US Patent 5,928,321).

Blumenau and Ozcelik teach claim 10 as stated above.

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Blumenau teaches Claim 11, which states: "The apparatus of claim 10, further comprising a memory usage module to couple to said memory bandwidth module, said memory usage module to provide memory usage information to said memory bandwidth module to generate said assignment cost values." (*Column 10, lines 39-51 – State the following: "Although the WWNs of the source and destination ports could be used in each request to uniquely identify the source and destination ports, each WWN contains so many bits that an undue amount of transmission bandwidth and data processing capability would be expended if the source and destination WWNs were used in each request. Therefore, it is desirable to assign a temporary identifier to each port in the data network in such a fashion that the identifier is unique to the configuration of the network at any given time, but not necessarily unique to each port for all time. Therefore, such a temporary identifier can have fewer bits than a WWN yet uniquely identify a source or desired destination of a request transmitted through the network"*)

6. Claim 12 is rejected under 35 U.S.C.103(a) as being unpatentable over Blumenau et al., as applied to Claim 10 above, further in view of Ozcelik et al. (US Patent 5,928,321).

Blumenau and Ozcelik teach claim 10 as stated above.

Blumenau teaches Claim 12, which states: "The apparatus of claim 10, wherein said memory devices comprise internal memory and external memory." (*Figure 4, Components 94 and 77 both show external and internal memories respectively.*)

7. Claim 13 is rejected under 35 U.S.C.103(a) as being unpatentable over Blumenau et al., as applied to Claim 10 above, further in view of Ozcelik et al. (US Patent 5,928,321).

Blumenau and Ozcelik teach claim 10 as stated above.

Blumenau teaches Claim 13, which states: "The apparatus of claim 10, wherein said memory devices have different latency times, throughput, or power requirements." (*Column 6, lines 49-51 – State the following: "FIG. 40 is a block diagram of a storage area network similar to that shown in FIG. 39 but including additional network loops for higher throughput."*)

8. Claim 14 is rejected under 35 U.S.C.103(a) as being unpatentable over Blumenau et al., as applied to Claim 10 above, further in view of Ozcelik et al. (US Patent 5,928,321).

Blumenau and Ozcelik teach claim 10 as stated above.

Blumenau teaches Claim 14, which states: "The apparatus of claim 10, wherein said agent comprises one of a software program and hardware device." (*Column 32, lines 5-57 – State the following: "The storage subsystem also enhances disaster recovery capabilities because it is easy to recover from the destruction of a commodity server simply by plugging in a replacement commodity server having the same hardware configuration." Abstract, lines 6-7 – State the following: "The virtual ports and the virtual switch are defined by software."*)

9. Claim 15 is rejected under 35 U.S.C.103(a) as being unpatentable over Blumenau et al. further in view of Ozcelik et al. (US Patent 5,928,321) and Dent (US PG Pub 2001/0004595).

Blumenau and Ozcelik teach the portion of Claim 15 as follows:

- Claim 15. A system, comprising:
- and a memory management module to couple to said processing system, said memory management module to manage assigning a plurality of agents to use a first set of memory devices from said plurality of memory devices based on an assignment cost value, and to reassign said plurality of agents to a second set of memory devices from said plurality of memory devices to lower said assignment cost value. (*Column 10, lines 39-51 – State the following: "Although the WWNs of the source and destination ports could be used in each request to uniquely identify the source and destination ports, each WWN contains so many bits that an undue amount of transmission bandwidth and data processing capability would be expended if the*

source and destination WWNs were used in each request. Therefore, it is desirable to assign a temporary identifier to each port in the data network in such a fashion that the identifier is unique to the configuration of the network at any given time, but not necessarily unique to each port for all time. Therefore, such a temporary identifier can have fewer bits than a WWN yet uniquely identify a source or desired destination of a request transmitted through the network". Column 10, lines 61-67 and Column 11, lines 1-2 – State the following: "The use of temporary rather than permanent identifiers for source and destination addresses in the network introduces the problem of assigning and reassigning the temporary identifiers when the configuration of the network is defined and changed. For example, when a private loop is changed into a public loop by connecting a port of a switch to the loop, temporary addresses must be assigned to other ports of the switch and to the ports of devices that become connected to those other ports")

Blumenau and Ozcelik's inventions differ from the claimed invention in that there is no specific reference to an antenna being coupled to a processor.

Blumenau fails to teach the portions of Claim 15 which state "an antenna; a processing system to connect to said antenna, said processing system having a processor and a plurality of memory devices". However, Dent's invention discloses the following: "As shown, the transmitter and receiver are each coupled with antenna 51 and the processor 47" (Section 0018, lines 5-6). It would have been obvious to one of ordinary skill in the art, having the teachings of the "Virtual Ports for Data Transferring of a Data Storage System" of Blumenau, Ozcelik's "Task and Stack Manager for Digital Video Decoding", and Dent's "Dual-mode methods, systems, and terminals providing reduced mobile terminal registrations" before him at the time the invention was made, to combine the inventions so that an antenna could be coupled to the processor so that the system would be able to include wireless communication.

10. Claim 16 is rejected under 35 U.S.C.103(a) as being unpatentable over Blumenau et al. further in view of Ozcelik et al. (US Patent 5,928,321) and Dent (US PG Pub 2001/0004595)..

Blumenau, Ozcelik and Dent teach claim 15 as stated above.

Dent teaches Claim 16, which states: "The system of claim 15, wherein said processing system further comprises a communication fabric to couple said processor to said memory devices." (*Section 0004, lines 1-4 – State the following: "It is clear that in such a dual mode communication system, the network should preferably know whether a particular mobile phone should be called via the land-based cellular system or via the satellite system"*)

11. Claim 17 is rejected under 35 U.S.C.103(a) as being unpatentable over Blumenau et al. further in view of Ozcelik et al. (US Patent 5,928,321) and Dent (US PG Pub 2001/0004595)..

Blumenau, Ozcelik and Dent teach claim 15 as stated above.

Blumenau teaches Claim 17, which states: "The system of claim 15, wherein said memory management module comprises: a task management module to retrieve a set of virtual addresses used by an agent; a memory assignment module to couple to said task manager, said memory assignment module to assign said virtual addresses to a first set of physical addresses for said plurality of memory devices; and a memory bandwidth module to couple to said memory assignment module, said memory bandwidth module to generate said assignment cost values." (*Column 10, lines 39-51 – State the following: "Although the WWNs of the source and destination ports could be used in each request to uniquely identify the source and destination ports, each WWN contains so many bits that an undue amount of transmission bandwidth and data processing capability would be expended if the source and destination WWNs were used in each request. Therefore, it is desirable to assign a temporary identifier to each port in the data network in such a fashion that the identifier is unique to the configuration of the network at any given time, but not necessarily unique to each port for all time. Therefore, such a temporary*

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identifier can have fewer bits than a WWN yet uniquely identify a source or desired destination of a request transmitted through the network". Column 10, lines 61-67 and Column 11, lines 1-2

– State the following: "The use of temporary rather than permanent identifiers for source and destination addresses in the network introduces the problem of assigning and reassigning the temporary identifiers when the configuration of the network is defined and changed. For example, when a private loop is changed into a public loop by connecting a port of a switch to the loop, temporary addresses must be assigned to other ports of the switch and to the ports of devices that become connected to those other ports")

12. Claim 18 is rejected under 35 U.S.C.103(a) as being unpatentable over Blumenau et al. further in view of Ozcelik et al. (US Patent 5,928,321) and Dent (US PG Pub 2001/0004595)..

Blumenau, Ozcelik and Dent teach claim 15 as stated above.

Blumenau teaches Claim 18, which states: "The apparatus of claim 16, further comprising a memory usage module to couple to said memory bandwidth module, said memory usage module to provide memory usage information to said memory bandwidth module to generate said assignment cost values." (Column 10, lines 39-51 – State the following: "Although the WWNs of the source and destination ports could be used in each request to uniquely identify the source and destination ports, each WWN contains so many bits that an undue amount of transmission bandwidth and data processing capability would be expended if the source and destination WWNs were used in each request. Therefore, it is desirable to assign a temporary identifier to each port in the data network in such a fashion that the identifier is unique to the configuration of the network at any given time, but not necessarily unique to each port for all

time. Therefore, such a temporary identifier can have fewer bits than a WWN yet uniquely identify a source or desired destination of a request transmitted through the network”)

Allowable Subject Matter

13. Claims 3-8 and 20-22 are allowed.

The following is an examiner's statement of reasons for allowance:

14. Claim 3 declares the following:

- determining a memory read traffic value using said read rate value and said first memory map, and a write traffic value using said write rate value and said first memory map;
- determining a read cost value and a write cost value for said memory types;
- determining an assignment read cost value by multiplying said memory read traffic value with said read cost value, and an assignment write cost value by multiplying said memory write traffic value with said write cost value;
- and generating said first assignment cost value by summing said assignment read cost value with said assignment write cost value.

The above limitations are written in such a manner that they cannot be overcome with prior art. Read and write cost values that are determined by multiplying memory traffic values with other cost values is a concept that is original and novel. Therefore, Claim 3 is allowed.

15. Claims 4-8 are dependents of Claim 3, and are therefore also allowed.

16. Claim 20 declares the following:

The article of claim 19, wherein the stored instructions, when executed by a processor, generate said first assignment cost value using stored instructions operable to identify a number of data objects associated with said agent, receive a read rate value and a write rate value for said data objects, map each data object to a memory type to form a first memory map, determine a memory read traffic value using said read rate value and said first memory map, and a write traffic value using said write rate value and said first memory map, determine a read cost value and a write cost value for said memory types, determine an assignment read cost value by multiplying said memory read traffic value with said read cost value, and an assignment write cost value by multiplying said memory write

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traffic value with said write cost value, and generate said first assignment cost value by summing said assignment read cost value with said assignment write cost value.

The above limitations are written in such a manner that they cannot be overcome with prior art. For instance, determining "an assignment read cost value by multiplying said memory read traffic value with said read cost value, and an assignment write cost value by multiplying said memory write traffic value with said write cost value" is a limitation that cannot be overcome with prior art. The sequence of events described in Claim 20 is indeed novel, and is therefore allowable. Therefore, Claim 20 is allowed.

17. Claims 21-22 are dependents of Claim 20, and are therefore also allowed.

18. In conclusion, claims 6, and 18-19 are allowed due to their specific nature and because they all overcome obviousness.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lev I. Iwashko whose telephone number is (571)272-1658. The examiner can normally be reached on M-F (alternating Fridays), from 8-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on (571)272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Lev Iwashiko



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